Message

From: LEE, LILY [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=D6085A744F9347E6836C54C0E85B97B2-LLEE06]
Sent: 9/14/2016 9:14:22 PM
To: Karla Brasaemle (kbrasaemle@techlawinc.com) [kbrasaemle@techlawinc.com]
CC: Balkissoon, Indira [ibalkissoon@techlawinc.com]; LINCOFF, MEILING [Lincoff.Meiling@epa.gov]
Subject: Outline of approach by 10/3 - FW: BPRG calculation of risk for equipment, waste, & bldgs?
Attachments: Hunters Pt Basewide Rad 2006 release criteria table.pdf; Dose-risk comparison RESRAD-PRG 2016-8-26.xlsx

Dear Karla,

I would like your help to estimate the risk level from the attached release criteria used for structures, equipment and waste, as calculated by EPA's Building PRG calculator.

Below is what I found from Rob from before mostly using the SPRG's. I saw that he used BPRGs for 4 radionuclides.

But I'd like a full set using the BPRG's for all the radionuclides. I'd like using progeny or not based on the 2006 criteria and using a conservative scenario. I'd like to set up a conf call with you, your health physicist, and Rob to understand the parameters he used. I think it might have been residential occupancy by a family of 4 for 26 yrs. See attached spreadsheet for calculations he did before.

Please deliver by 10/3 a rough outline of an approach for doing these calculations. Thanks!

- Lily

Lily

Lily Lee
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From: Terry, Robert
Sent: Wednesday, June 08, 2016 12:50 PM
To: LEE, LILY <LEE.LILY@EPA.GOV>
Cc: Guria, Peter <Guria.Peter@epa.gov>
Subject: RE: Thank you for offering to do a table showing concentrations equivalent to 10^-4

Here's a table that I prepared for you last winter, analyzing the risks associated with U.S. NRC Reg Guide 1.86 building and equipment surface contamination limits.

Radionuclide	NRC Reg Guide 1.86 Fixed contamination Limit (average) dpm/100 cm^2	Risk See NOTE 3	EPA BPRG Calculator -- Indoor Worker Fixed (external ground plane) contamination Limit (average) pCi/cm^2	dpm/100 cm^2	Risk
Alpha-emitting nuclides					
^{226}Ra	100	5.00E-06	11	2000	10^{-4}
Uranium	5000	6.49E-06	345	77000	10^{-4}
Beta-emitting nuclides					
^{60}Co	5000	7.14E-05	31	7000	10^{-4}
^{137}Cs	5000	4.55E-05	48	11000	10^{-4}

NOTE 1: EPA BPRG values are converted to dpm/100 cm^2 for comparison to Reg Guide 1.86 values

NOTE 2: EPA BPRG values for fixed contaminants are rounded to the nearest 1000 dpm/100 cm^2.

NOTE 3: The BPRG Calculator's slope factors use a risk/dose coefficient of 8.46×10^{-7} per mrem as described in Federal Guidance Report No. 13 *Cancer Risk Coefficients for Environmental Exposure to Radionuclides* EPA402-R-99-001 dated September 1999. The risk associated with Reg Guide 1.86 residual contamination limits is shown by comparison to the BPRG calculator-generated limits. The risk associated with Reg Guide 1.86 limits was calculated using the BPRG calculator.

NOTE 4: The BPRG calculator's limits for (natural) uranium have been combined assuming equal concentrations of ^{234}U and ^{238}U; the contribution from ^{235}U has been ignored.

The table in the following April 5th email shows surface contamination limits that I derived at the 10-4 risk level using the PRG calculator. If you compare the values in the table below with the limits in Reg Guide 1.86, you will easily see that the Reg Guide 1.86 limits generally satisfy Superfund requirements.

From: Terry, Robert
Sent: Tuesday, April 05, 2016 3:41 PM
To: LEE, LILY <LEE.LILY@EPA.GOV>
Cc: Guria, Peter <Guria.Peter@epa.gov>
Subject: RE: Thank you for offering to do a table showing concentrations equivalent to 10^-4

Here's a table I prepared for you at the end of February. Let me know if you need anything else.

SPRG (Surfaces) and PRG (Soil & Water) Calculator Results at the 1 x 10^{-4} Risk Level
Calculated 26-Feb-2016

	Surfaces dpm/100 cm^2		Soil pCi/g		Water pCi/L
Radionuclide	Equipment & Waste	Structures	Construction Worker	Residential	Equipment & Waste
Americium-241	381840	381840	5.19	4.70	33
Cesium-137	21201	21201	10.1	4.66	119
Cobalt-60	13165	13165	5.37	3.19	259
Europium-152	14319	14319	6.38	3.76	642
Europium-154	17605	17605	7.74	4.52	396
Hydrogen-3	--	--	7.74	4.26	1370
Plutonium-239	--	--	1360	3.57	25
Radium-226	5505	5505	2.33	0.63	0.044
Strontium-90	541680	541680	998	6.39	46
Thorium-232	--	--	4.72	0.35	2.9
Uranium-235	62160	62160	34	4.75	46

NOTES: [a]The estimates for Surface PRGs are taken from the SPRG Calculator using default values for the 3-D direct external exposure indoor worker scenario. Requirements for building structure surfaces and for equipment & waste surfaces are taken to be the same, as per U.S. NRC Regulatory Guide 1.86 *Termination of Operating Licenses for Nuclear Reactors* dated June 1974 and reviewed December 2011.

[b]The estimates for Soil PRGs are taken from the PRG Calculator using default values for the outdoor worker and residential scenarios.

[c]The estimates for Water PRGs are taken from the PRG Calculator using default values for the residential scenario. Generally, MCLs for drinking water are preferred values for water.

[d]By agreement between the Navy and EPA Region 9 the remediation goal for soil is 1.0 pCi/g.

From: LEE, LILY
Sent: Tuesday, April 05, 2016 1:21 PM
To: Terry, Robert <Terry.Robert@epa.gov>
Subject: Thank you for offering to do a table showing concentrations equivalent to 10^-4

Dear Rob,

I appreciate your offer yesterday to do a table showing concentrations equivalent to 10^-4 risk. That would be helpful.

Lily

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